Claims

[c1] A fin-type field effect transistor (FinFET) structure comprising:
a substrate;
fins extending from said substrate; and
gate dielectrics covering said fins,
wherein said gate dielectrics have different thickness.

[c2] The FinFET structure in claim 1, wherein said fins are utilized in different types of transistors on said substrate, and wherein one type of transistor includes gate dielectrics having a first thickness and a second type of transistor includes gate dielectrics having a second thickness different than said first thickness.

[c3] The FinFET structure in claim 1, wherein said fins are utilized in multiple-fin transistors.

[c4] The FinFET structure in claim 1, wherein thicker gate dielectrics comprise multiple layers of dielectric and thinner gate dielectrics comprise less layers of dielectric.

[c5] The FinFET structure in claim 1, further comprising a cap over said fins.

[c6] The FinFET structure in claim 5, wherein said cap comprises a different material than said gate dielectrics.

[c7] A fin-type field effect transistor (FinFET) structure comprising:
a substrate;
fins extending from said substrate, wherein said fins comprise a central channel region and source and drain regions on opposite sides of said channel region; and
gate dielectrics covering said channel region of fins, wherein said gate dielectrics have different thickness.

[c8] The FinFET structure in claim 7, wherein said fins are utilized in different types of transistors on said substrate, and wherein one type of transistor includes gate dielectrics having a first thickness and a second type of transistor includes gate dielectrics having a second thickness different than said first thickness.

[c9] The FinFET structure in claim 7, wherein said fins are utilized in multiple-fin transistors.

[c10] The FinFET structure in claim 7, wherein thicker gate dielectrics comprise multiple layers of dielectric and thinner gate dielectrics comprise less layers of dielectric.

[c11] The FinFET structure in claim 7, further comprising a cap over said fins.

[c12] The FinFET structure in claim 11, wherein said cap comprises a different material than said gate dielectrics.

[c13] A fin-type field effect transistor (FinFET) structure comprising:
a substrate;
fins extending from said substrate; and
gate dielectrics covering said fins,
wherein said fins are utilized in different types of transistors on said substrate, and wherein a first type of transistor includes gate dielectrics having a first thickness and a second type of transistor includes gate dielectrics having a second thickness different than said first thickness.

[c14] The FinFET structure in claim 13, wherein said fins are utilized in multiple-fin transistors.

[c15] The FinFET structure in claim 13, wherein thicker gate dielectrics comprise multiple layers of dielectric and thinner gate dielectrics comprise less layers of dielectric.

[c16] The FinFET structure in claim 13, further comprising a cap over said fins.

[c17] The FinFET structure in claim 5, wherein said cap comprises a different material than said gate dielectrics.

[c18] A method of forming a fin-type field effect transistor (FinFET) structure, said method comprising:
patterning fins on a substrate;
forming a first gate dielectric on said fins;
protecting first fins using a mask;
removing said first gate dielectric from unprotected second fins;
removing said mask from said first fins; and
forming an additional gate dielectric on said second fins and on said first gate dielectric that covers said first fins to form different thicknesses of gate dielectrics on said first fins when compared to said second fins.

[c19] The method in claim 18, further comprising utilizing said fins in different types of transistors on said substrate, wherein one type of transistor includes gate dielectrics having a first thickness and a second type of transistor includes gate dielectrics having a second thickness different than said first thickness.

[c20] The method in claim 18, further comprising utilizing said fins in multiple-fin transistors.

[c21] The method in claim 18, wherein said process of forming an additional gate dielectric forms multiple layers of dielectric over said first fins and forms only said additional

gate dielectric over said second fins.

[c22] The method in claim 18, wherein said process of patterning said fins forms a cap over said fins.

[c23] The method in claim 22, wherein said cap comprises a different material than said gate dielectrics.

[c24] A method of forming a fin-type field effect transistor (FinFET) structure, said method comprising:
patterning fins on a substrate;
forming a first gate dielectric on said fins;
protecting first fins using a mask;
removing said first gate dielectric from unprotected second fins;
removing said mask from said first fins;
forming an additional gate dielectric on said second fins and on said first gate dielectric that covers said first fins to form different thicknesses of gate dielectrics on said first fins when compared to said second fins;
doping ends of said fins to form source and drain regions separated by a central channel regions of said fins; and
forming a gate conductor over said channel regions, wherein said gate dielectrics insulate said channel regions from said gate conductor.

[c25] The method in claim 24, further comprising utilizing said fins in different types of transistors on said substrate, wherein one type of transistor includes gate dielectrics having a first thickness and a second type of transistor includes gate dielectrics having a second thickness different than said first thickness.

[c26] The method in claim 24, further comprising utilizing said fins in multiple-fin transistors.

[c27] 27.The method in claim 24, wherein said process of forming an additional gate dielectric forms multiple layers of dielectric over said first fins and forms said additional gate dielectric only over said second fins.

[c28] The method in claim 24, wherein said process of patterning said fins forms a cap over said fins.

[c29] The method in claim 28, wherein said cap comprises a different material than said gate dielectrics.

[c30] A method of forming a fin-type field effect transistor (FinFET) structure, said method comprising:
patterning fins on a substrate;
forming a first gate dielectric on said fins;
protecting first fins using a mask;
removing said first gate dielectric from unprotected second fins;

removing said mask from said first fins;
forming an additional gate dielectric on said second fins and on said first gate dielectric that covers said first fins to form different thicknesses of gate dielectrics on said first fins when compared to said second fins; and
utilizing said fins in different types of transistors on said substrate, wherein one type of transistor includes gate dielectrics having a first thickness and a second type of transistor includes gate dielectrics having a second thickness different than said first thickness.

[c31] The method in claim 30, further comprising utilizing said fins in multiple-fin transistors.

[c32] The method in claim 30, wherein said process of forming an additional gate dielectric forms multiple layers of dielectric over said first fins and forms said additional gate dielectric only over said second fins.

[c33] The method in claim 30, wherein said process of patterning said fins forms a cap over said fins.

[c34] The method in claim 33, wherein said cap comprises a different material than said gate dielectrics.